CLAIMS

What is claimed is:

1. A spindle, comprising:

a shaft;

a sleeve coaxial with the shaft;

a first gap formed between the sleeve and the shaft for facilitating rotation therebetween;

a hub bound to one of the shaft and the sleeve;

a second gap located between the hub and the sleeve, wherein the second gap is larger than the first gap; and wherein

the hub is adapted to be secured to a rotor magnet which is adjacent to a stator, such that the second gap reduces magnetic flux leakage into the sleeve and a substantially negligible amount of flux crosses the first gap into the shaft.

2. The spindle of claim 1 wherein the first gap is on the order of a few microns.

3. The spindle of claim 1 wherein the shaft is stationary, the sleeve rotates relative to the shaft, and the hub is bound to the sleeve.

4. The spindle of claim 1 wherein the second gap is filled with a substantially non-permeable material.

5. The spindle of claim 1 wherein the second gap is filled with epoxy.

6. The spindle of claim 1 wherein the second gap is the range of 200 to 300 microns.

7. A precision spindle assembly, comprising in combination:

a stator;

a spindle hub having a rotor magnet mounted thereto that is rotatable relative to the stator; wherein the spindle hub comprises:

a ferromagnetic stationary shaft;

a rotatable ferromagnetic sleeve coaxial with the shaft;

a fluid bearing gap formed between the sleeve and the shaft for facilitating rotation therebetween;

a ferromagnetic hub bound to the sleeve;

a large gap located between the hub and the sleeve, wherein the large gap is larger than the fluid bearing gap; and wherein

the large gap reduces magnetic flux leakage into the sleeve such that a substantially negligible amount of flux crosses the fluid bearing gap into the shaft.

8. The precision spindle assembly of claim 7 wherein the fluid bearing gap is on the order of a few microns.

9. The precision spindle assembly of claim 7 wherein the large gap is filled with a substantially non-permeable material.

10. The precision spindle assembly of claim 7 wherein the large gap is filled with epoxy.

11. The precision spindle assembly of claim 7 wherein the large gap is the range of 200 to 300 microns.

12. A method of insulating a precision spindle assembly against magnetic flux, comprising the steps of:

(a) providing a stator, and a spindle assembly with a rotor magnet, a shaft, a sleeve, a fluid bearing gap between the sleeve and the shaft, a hub on one of the shaft and the sleeve, and a gap between the hub and the sleeve;

(b) rotating the rotor magnet relative to the stator to induce a magnetic field; and

(c) reducing magnetic flux leakage into the sleeve with the gap such that a substantially negligible amount of flux crosses the fluid bearing gap into the shaft.

13. The method of claim 12 wherein step (a) comprises forming the fluid bearing gap in the range of a few microns.

14. The method of claim 12 wherein step (a) comprises filling the gap with a substantially non-permeable material.

15. The method of claim 12 wherein step (a) comprises filling the gap with an epoxy.

16. The method of claim 12 wherein step (a) comprises forming the gap in the range of 200 to 300 microns.